## Knowledge organiser

## Respiration

Respiration is the chemical reaction which occurs inside the mitochondria of all living cells to release energy for living functions and processes, e.g. movement, warmth and building larger molecules for growth and repair. The reaction is exothermic, meaning that energy is released to the surroundings.

Respiration can be either aerobic (using oxygen) or anaerobic (without using oxygen).

```
carbon dioxide water energy C6H12O6 + 6O2 → 6CO2 + 6H2O + ATP
```

In anaerobic respiration, the glucose is not completely oxidised. This means that there is less energy released than in aerobic respiration.

```
glucose lactic acid energy C6H12O6 ⇒ 2C3H6O3 + ATP
```

In plants and yeast, anaerobic respiration makes some different products. The reaction is also called fermentation and is used in bread-making and beer-brewing.

```
glucose ethanol dioxide energy
C6H12O6 ⇒ C2H5OH + CO2 + ATP
```